AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-20 (Canceled)

Claim 21 (New) A fiber optic current sensor, comprising:

a coiled sensor fiber which encloses a current conductor; and

at least one phase delay element adjoining the sensor fiber;

wherein the sensor fiber has a Verdet's constant V, which Verdet's constant V has a temperature dependence;

wherein the sensivity of the sensor is describable by a generally temperature-dependent function SK(T);

wherein changes in the function SK(T) owing to the temperature dependence of the Verdet's constant V are describable by a function TV(T);

wherein changes in the function SK(T) owing to the temperature dependence of the at least one phase delay element are describable by a function TW(T);

wherein the phase delay of the at least one phase delay element is chosen such that the function TW(T) is such that the product $K(T) = TV(T) \cdot TW(T)$ is at least approximately temperature independent.

Claim 22 (New) The current sensor as claimed in claim 21, wherein the at least one phase delay element has a phase delay angle whose value deviates from a phase delay angle of an ideal phase delay element.

Claim 23 (New) The current sensor as claimed in claim 21, wherein the at least one phase delay element is a $\lambda/4$ optical fiber segment with an elliptical core, and wherein the $\lambda/4$ optical fiber segment has a length which deviates from a quarter or an odd multiple of a quarter of a beat length of orthogonal polarization modes.

Claim 24 (New) The current sensor as claimed in claim 22, comprising at least two phase delay elements, each having a fast axis, wherein the magnitude of the phase delay angles is selected as a function of a mutual alignment of the fast axes of the phase delay elements.

Claim 25 (New) The current sensor as claimed in claim 22, wherein the magnitude of the phase delay angle is selected as a function of a sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor.

Claim 26 (New) The current sensor as claimed in claim 22, comprising at least two phase delay elements, each having a fast axis, the fast axes being orientated at least approximately parallelly to one another, wherein the magnitude of the phase delay angle is

selected as a function of a sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor, wherein

in the case of a of negative sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor, the phase delay angle is greater than a phase delay angle of an ideal phase delay element, and

in the case of a of positive sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor, the phase delay angle is smaller than a phase delay angle of an ideal phase delay element.

Claim 27 (New) The current sensor as claimed in claim 22, comprising at least two phase delay elements, each having a fast axis, the fast axes being orientated at least approximately orthogonally to one another, wherein the magnitude of the phase delay angle is selected as a function of a sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor, wherein

in the case of a of negative sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor, the phase delay angle is smaller than a phase delay angle of an ideal phase delay element, and

in the case of a of positive sign of the contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor, the phase delay angle is greater than a phase delay angle of an ideal phase delay element.

Claim 28 (New) The current sensor as claimed in claim 21, the current sensor comprising a Sagnac interferometer.

Claim 29 (New) The current sensor as claimed in claim 21, the current sensor comprising a reflection interferometer.

Claim 30 (New) A fiber optic current sensor, comprising:

a coiled sensor fiber which encloses a current conductor; and

at least one phase delay element adjoining the sensor fiber;

wherein the at least one phase delay element has a phase delay angle whose value deviates from a phase delay angle of an ideal phase delay element; and

wherein the phase delay of the at least one phase delay element is chosen such that a contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor at least approximately compensates for a contribution of a Verdet's constant of the sensor fiber to the temperature dependence of the sensivity of the sensor.

Claim 31 (New) A fiber optic current sensor, comprising:

a coiled sensor fiber which encloses a current conductor; and

at least one phase delay element adjoining the sensor fiber;

wherein the at least one phase delay element is a $\lambda/4$ phase delay element; and

wherein the $\lambda/4$ phase delay element has a length which deviates from a quarter or an odd multiple of a quarter of a beat length of orthogonal polarization modes; and

wherein the length of the at least one phase delay element is chosen such that a contribution of the at least one phase delay element to the temperature dependence of the sensivity of the sensor at least approximately compensates for a contribution of a Verdet's constant of the sensor fiber to the temperature dependence of the sensivity of the sensor.